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RECOVERY OF NICOTINE FROM *NICOTIANA RUSTICA* BY STEAM DISTILLATION

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INTRODUCTION

The demand for nicotine during recurring periods in the past has exceeded the supply available from the wastes of the tobacco industry, such as stems, damaged leaves and sweepings. In the course of the Eastern Regional Research Laboratory's investigation of *Nicotiana rustica* as a commercial source of nicotine, studies were made of methods of recovering nicotine from this plant. This paper reports research to determine if the commercial method of distilling nicotine from tobacco could be used with green and dried *N. rustica*.

EQUIPMENT

Figure 1 shows a diagrammatic sketch of the equipment. The distillation vessel was a conventional, cylindrical, agitated drier. It was horizontal, 2 feet in diameter, and 4 feet long; all parts were steam jacketed, including the charging and discharging door. It was equipped with a ribbon-type agitator attached to a horizontal, steam-heated shaft, which rotated at 6 r.p.m. Vapor evolved from the drier was cleaned by passing it through a flannel filter bag, which was also steam jacketed. The dust-free vapor was condensed in a water-cooled, surface condenser. In some of the experiments, nicotine was scrubbed from the condenser vent gas by a dilute hydrochloric acid solution in a 2-inch diameter column packed to a height of 4 feet with 3/8-inch Raschig rings.

OPERATION

Green *N. Rustica*

The first group of experiments was made with leaves and whole plants (leaves and stalks) of green *N. rustica*. The material was cut with a rotary knife cutter and disintegrated in a hammer mill equipped with a 1/2-inch screen. Approximately 200 pounds of the material thus disintegrated was put in the drier, lime was added to release nicotine, and the two materials were mixed by the agitator. In some of the experiments, the lime and disintegrated material were mixed before they were put in the drier. Steam at 100 p.s.i. gage was admitted to the heating jackets of the drier, and distillation was

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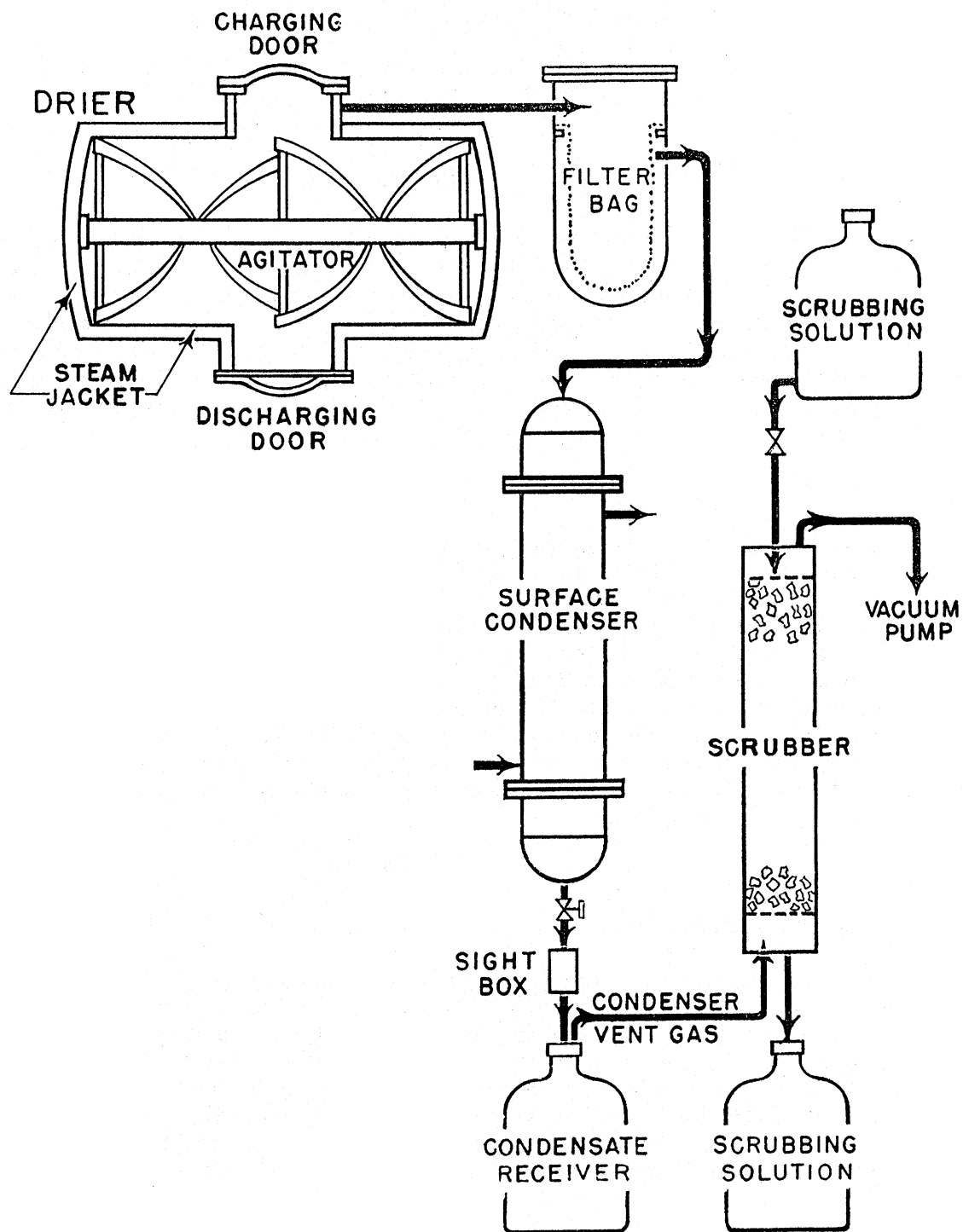


FIG. 1--DIAGRAMATIC FLOW SHEET.